AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1.   (Previously presented) A method for providing a real-time broadcast service in a mobile communication system, the mobile communication system comprising a radio access network and a plurality of mobile terminals, where the radio access network has an original service hierarchy; the method comprising:

linking the real-time broadcast service to the radio access network;

adding a broadcast service hierarchy into the radio access network, assigning downlink special broadcast resources for the broadcast service hierarchy, and broadcasting the real-time broadcast service to the mobile terminals through the downlink special broadcast resources; and

any of the mobile terminals communicating with the radio access network using uplink and/or downlink resources of the original service hierarchy, receiving the real-time broadcast service using the downlink special broadcast resources, and switching between the original service hierarchy and the broadcast service hierarchy.

2.   (Previously Presented) The method according to claim 1, wherein the process of linking the real-time broadcast service to the radio access network comprising:

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transmitting content information of the real-time broadcast service to an information transmitting server, and accessing the content information of the real-time broadcast service to the radio access network by the information transmitting server.

3.   (Previously Presented)   The method according to claim 1, wherein the downlink special broadcast resources are downlink special carrier frequencies;

the method further comprising: dividing the broadcast service hierarchy into cells, the adjacent cells employ different scrambling codes, and defining multiple cells into a location area; and

when switching to the broadcast service hierarchy, the mobile terminal staying in a cell of the broadcast service hierarchy, controlling handoff of the cell, and monitoring paging of the cell in the broadcast service hierarchy.

4.   (Previously Presented) The method according to claim 3, further comprising: setting a broadcast channel for broadcasting corresponding cell information and a paging channel for paging mobile terminals in the cell of the broadcast service hierarchy.

5.   (Previously Presented) The method according to claim 4, wherein said cell information includes location area code and paging channel configuration information of the cell in the broadcast service hierarchy, and carrier frequencies, scrambling codes, Random Access Channel (RACH), an AICH public channel relating to RACH and Forward Access Channel (FACH) of the adjacent cells in the original service hierarchy.

JML/kk

6.   (Previously Presented)   The method according to claim 3, wherein the scrambling codes in the broadcast service hierarchy and those in the original service hierarchy are either the same or different; the cells of the broadcast service hierarchy and those of the original service hierarchy are either superposed or not.

7.   (Previously Presented)   The method according to claim 3, wherein the handoff includes location update which is triggered when the mobile terminal switches between the broadcast service hierarchy and the original service hierarchy, and when the location area of the mobile terminal changes in the broadcast service hierarchy.

8.   (Previously Presented)   The method according to claim 7, wherein the process of triggering location update when the location area changes in the broadcast service hierarchy comprising: the mobile terminal obtaining information of cells in the original service hierarchy from the broadcast channel of the broadcast service hierarchy, the cells in the original service hierarchy are adjacent to the current cell of the broadcast service hierarchy, finding a cell in the original service hierarchy where the mobile terminal can stay, and sending a random access request utilizing the Random Access Channel (RACH) in the cell of the original service hierarchy;

after receiving AICH information from the cell of the original service hierarchy, the mobile terminal tuning the receiving frequency to the downlink carrier frequency, starting search and synchronization for the current cell of the broadcast service hierarchy,

JML/kk

meanwhile sending a message containing location update information to the radio access network utilizing the uplink carrier frequency of the original service hierarchy, and waiting to receive a location update confirming message at the current cell of the broadcast service hierarchy.

9.   (Previously Presented)   The method according to claim 3, wherein the process of monitoring paging in the broadcast service hierarchy comprising: the radio access network selecting a cell in a corresponding location area according to the received location information of the mobile terminal, and sending downlink paging information according to the carrier frequency of the broadcast service hierarchy or the carrier frequency of the original service hierarchy.

10.   (Previously Presented) The method according to claim 3, further comprising: after switching from the broadcast service hierarchy to the original service hierarchy, the mobile terminal making a reply or initiating a call in the original service hierarchy.

11.   (Previously Presented)   The method according to claim 10, wherein the process of making a reply or initiating a call further comprising: sending information of the adjacent cells in the original service hierarchy utilizing the broadcast channel of the broadcast service hierarchy.

JML/kk

12.   (Previously Presented) The method according to claim 3, wherein the mobile terminal shares a set of receiving system and synchronizing system with other mobile terminals in the broadcast service hierarchy and the original service hierarchy.

13.   (Previously Presented) The method according to claim 3, wherein the mobile terminal utilizes a different receiving system, and shares a set of synchronizing system with other mobile terminals in the broadcast service hierarchy and the original service hierarchy.

14.   (Previously Presented)   The method according to claim 1, wherein the downlink special broadcast resources are downlink special scrambling codes;

the method further comprising: superposing the locations of cells of the broadcast service hierarchy over those of the original service hierarchy so as to form the structure of the cell of the original service hierarchy plus the cell of the broadcast service hierarchy, wherein the cells utilize the same downlink special scrambling code and a same special broadcast channel code for transmitting real-time broadcast information, the working mode of the mobile terminal keeps unchanged for the original service, pilot channel of the cells in the original service hierarchy is shared, and the real-time broadcast service is supported under both idling mode and connecting mode.

15.   (Previously Presented)   The method according to claim 14, wherein the process of assigning downlink special scrambling codes in the broadcast service hierarchy

JML/kk

comprising: adding a scrambling operation using the downlink special scrambling codes in the base station sender of each cell in the original service hierarchy, wherein the information of the broadcast service hierarchy and that of the original service hierarchy either share the same power amplifier or utilize respective power amplifiers.

16.   (Previously Presented)   The method according to claim 15, wherein the process of the sender includes performing modulation and spectrum spreading for the original service and real-time broadcast service;

the modulation and spectrum spreading for the original service includes source encoding, channel encoding, Quaternary Phrase-Shift Keying (QPSK), spectrum spreading and scrambling the spectrum spread results utilizing the downlink scrambling codes of each cell for the original service;

the modulation and spectrum spreading for the real-time broadcast service includes source encoding, channel encoding, QPSK, spectrum spreading and scrambling the spectrum spread results utilizing the downlink special scrambling codes for the real-time broadcast service.

17.   (Previously Presented)   The method according to claim 14, wherein the demodulation unit of RAKE receiver of the mobile terminal adopts downlink special scrambling codes for specially receiving the real-time broadcast service; channel decoding and source decoding is implemented respectively for the original service and real-time broadcast service after the signals pass the RAKE receiver; the channel code of RAKE

JML/kk

receiver is the special broadcast channel code, namely the downlink special scrambling code.

18.   (Currently Amended)   The method according to claim 14, wherein said structure of the cell of the original service hierarchy plus the cell of the broadcast service hierarchy is that range and location division of the cell of the original service hierarchy plus the broadcast service hierarchy is the same as that ~~of the macro cell~~ of the original service macro cell coving hierarchy in which the mobile network is covered by macro cells.

19.   (Previously Presented)   The method according to claim 14, wherein the method further comprising: keeping the mobile terminal under idle mode for the original service when the mobile terminal switches to the broadcast service hierarchy; when the mobile terminal is located in a macro cell, according to the channel estimation result for the public pilot frequency of this cell and the channel estimation result for the public pilot frequency of one or multiple adjacent cells with powerful signals, merging the received signals of multi cells and demodulating the signals on special broadcast channel; the mobile terminal selecting and reselecting cells, implementing location update and receiving paging information in terms of the process of original service; when the mobile terminal is located in a micro cell or a pico cell, according to the channel estimation result for the public pilot frequency of one or multiple adjacent cells with powerful signals, merging the received signals of multi cells and demodulating the signals on special broadcast channel;

JML/kk

the mobile terminal selecting and reselecting cells, implementing location update and receiving paging information in terms of the process of original service.

20.   (Previously Presented)   The method according to claim 14, further comprising: the mobile terminal evaluating the interference value to a service channel caused by the downlink special scrambling codes according to the demodulated special broadcast channel data and the information of channel transmission condition, scrambling code and channel code, and subtracting this interference value from the received signal.

21.   (Previously Presented) A mobile communication system for providing a real-time broadcast service, comprising:

a radio access network, having an original service hierarchy for providing an original service, and having a broadcast service hierarchy for providing the real-time broadcast service, wherein downlink special broadcast resources are assigned for the broadcast service hierarchy to broadcast the real-time broadcast service; and

a plurality of mobile terminals, wherein each of the mobile terminals communicates with the radio access network using uplink and/or downlink resources of the original service hierarchy, receives the real-time broadcast service using the downlink special broadcast resources, and switches between the original service hierarchy and the broadcast service hierarchy.